## REMARKS/ARGUMENTS

The office action of May 19, 2005 rejects several claims on various grounds. The office action cites U.S. Patent No. 5,130,936 to Sheppard et al. as anticipating or rendering obvious the subject matter of various claims. The applicant respectfully requests reconsideration and withdrawal of the rejections and objections.

Information Disclosure Statement

The applicant acknowledges the notice regarding the publication dates of the references disclosed in the information disclosure statement of March 26, 2004. At this time, it is believed that all available information regarding publication dates has been submitted.

Provisional Double Patenting Rejection

Claims 1 and 14 were provisionally rejected under the doctrine of obviousness-type double-patenting in view of U.S. Patent Application No. 10/367,355. The applicant acknowledges and traverses this rejection. In view of the provisional nature of the rejection and the ongoing prosecution of both applications, however, the applicant submits that the issue is not yet ripe to be addressed. The applicant thus reserves the right to respond to any such rejection as may be asserted when the rejection is no longer provisional.

§102 Rejections

Sheppard:

Claims 1-8, 14-21, 27-34, and 39-46 stand rejected as being anticipated by U.S. Patent No. 5,130,936 to Sheppard et al. ("the Sheppard reference"). The Sheppard reference discloses a "diagnostic tester [that] evaluates at least one inputted test signal corresponding to test data relating to at least one predetermined parameter of a system being tested, to produce first and second candidate signals corresponding respectively to first and second possible diagnoses of the condition of the system respectively having the first and second highest levels of certainty of

being valid, and first and second certainty signals corresponding respectively to values of the first and second highest levels of certainty."

To support a rejection as being anticipated under §102, a single reference must disclose each and every element and limitation of the claims. In the absence of even a single claim element or limitation, a rejection under §102 is inappropriate.

Further, it is well established that the terms of a claim are generally given their ordinary and customary meaning as they would have to a person of ordinary skill in the art. The person of ordinary skill in the art is deemed, however, to have read and understood the claims in the context of the specification.

In the present case, claims 1, 27, and 39 stand rejected in view of the Sheppard reference's asserted disclosure of various elements. The applicant respectfully traverses each these rejections, as the Sheppard reference fails to disclose the relevant elements and limitations of the claims.

Claim 1 requires "a tester configured to test a set of components and generate test data for the set of components". The office action indicates that the Sheppard reference discloses the tester (column 5, line 53) configured to test a set of components (column 5, line 65) for the set of components. The cited portions of the Sheppard reference, however, do not support the rejection. For example, although column 5, line 65 of the Sheppard reference mentions "components", the cited portion is referring to the components of the "diagnostic tester", not any components under test:

> As shown in FIGS. 1-3, one form of manual input diagnostic tester which is portable has a separate housing 11 which contains the <u>tester components</u>...

(Sheppard reference, column 5, lines 63-65; emphasis added). This portion of the Sheppard reference clearly refers to components of the tester itself, not components that are being tested and for which test data is generated. Thus, the cited portion of the Sheppard reference fails to

disclose the required tester configured to test a set of components and generate test data for the set of components.

Further, claim 1 requires that the components are fabricated in accordance with a fabrication process. The office action provides no support for the assertion that the "components" referred to in column 5, line 53 of the Sheppard reference are fabricated in accordance with a fabrication process. Thus, the applicant respectfully submits that the office action fails to support the §102 rejection.

In addition, claim 1 requires that the diagnostic system analyze the test data to identify a characteristic of the fabrication process for the components. To support the rejection, the office action indicates that the Sheppard reference discloses these limitations at column 5, line 54, and column 6, line 64. Upon examination, column 5, line 54 indicates that the "diagnostic testers" are adapted to receive test data input. Column 6, line 64 states that the "diagnostic tester" may be applicable to determining faults and malfunctions in electronic or electromechanical systems or manufacturing processes. The office action provides no indication how this mention of determining faults and malfunctions is connected to analyzing test data to identify a fabrication characteristic. Simply noting that a system can (1) receive test data and (2) be applicable to finding faults is not a disclosure of analyzing the test data to identify a characteristic of the fabrication process for the components as required by claim 1. On the contrary, simply receiving test data and being broadly applicable to determining faults and malfunctions does not imply that the test data is analyzed to identify a characteristic of the fabrication process.

Thus, in view of the failure of the Sheppard reference to disclose these and other required elements of claim 1, the applicant respectfully submits that the rejection of claim 1 should be withdrawn.

Likewise, claims 27 and 39 call for obtaining test data for the components. As indicated above, however, the "components" identified in the office action are components of the tester itself, not components that are being tested and for which test data is generated. In addition, claims 27 and 39 call for automatically identifying a characteristic of the fabrication process based on the test data. As indicated above, merely noting that a system can (1) receive test data

and (2) be applicable to finding faults is not a disclosure of identifying a characteristic of the fabrication process based on the test data. Therefore, the rejections of claims 27 and 39 are likewise inappropriate and should be withdrawn.

Claim 14 also stands rejected as being anticipated by the Sheppard reference. Claim 14 calls for a diagnostic system configured to identify a characteristic of the fabrication process based on the test data for the components. As indicated above, the Sheppard reference fails to disclose identifying a characteristic of the fabrication process based on the test data. Thus, the rejection of claim 14 under §102 is likewise improper and should be withdrawn.

In sum, the rejections of the independent claims 1, 14, 27, and 39 under §102 and the Sheppard reference are improper in view of the Sheppard reference's failure to disclose each and every claimed element and limitation. Further, because these rejections are inappropriate, the rejections of the dependent claims in view of the Sheppard reference, under both §§102 and 103, should likewise be withdrawn. Nonetheless, the applicant respectfully submits that the various further rejections of the dependent claims are improper and should be withdrawn regardless of the merits of the independent claim rejections.

For example, claims 2, 15, 28, and 40 call for the test data for the set of components to comprise one of several types of data, including electrical test data. The office action rejects these claims based on the recitation of "electrical test" in the Sheppard reference. The relevant portion of the Sheppard reference reads:

> [O]ne form of manual input diagnostic tester which is portable has a separate housing 11 which contains the tester components; a display 12 mounted in housing 11 for displaying test results, diagnoses, user prompts and similar types of information; a keyboard area 13 comprising a plurality of data entry keys 14 and a plurality of command keys 15 for entering test data and user commands to control the operation of the tester; conventional signal generating circuitry 16 responsive to actuation of keys 14 and 15 for generating digital electrical test and command signals, respectively, corresponding to the test data and commands entered by the operator; and a control and diagnostic analysis central

processing unit (CPU) 17 for controlling the operation of the tester and performing the diagnostic analysis routines stored therein.

(emphasis added). Thus, the electrical test signals in the Sheppard reference are generated by the "conventional signal generating circuitry". These signals are not test data for the components to be tested as required by the claims, but are instead signals generated by the "diagnostic tester". Therefore, the cited portion of the Sheppard reference does not support the rejection.

Claims 3, 16, 29, and 41 call for the diagnostic system to provide a corrective action suggestion based on the identified characteristic. These claims were rejected as being anticipated by the Sheppard reference based on disclosure at column 22, lines 39-41, which reads:

From the value E, a correction term is computed which is then propagated backward through the network, adjusting the node weights as it goes. The correction term is computed from the partial derivative of the error with respect to the weights.

The mere mention of a "correction term" does not amount to an anticipating disclosure of a corrective action suggestion based on the identified characteristic as required by the relevant claims. The disclosed "correction term" appears to be a mathematical factor, not a suggestion for corrective action. Further, the cited portion of the Sheppard reference does not disclose that the correction term is based on the identified characteristic as required by the claims. Consequently, the applicant respectfully submits that these rejections are improper and should be withdrawn.

Claims 4, 17, 30, and 42 stand rejected as being anticipated by the Sheppard reference, specifically the disclosure at column 19, line 4. The relevant claims call for the diagnostic system to comprise a pattern recognition system configured to recognize a pattern in the test data. The cited portion of the Sheppard reference reads:

The testing sufficiency evaluation approach of the present invention operates to recognize when sufficient differentiation between levels of certainty regarding the validity of alternative candidate diagnoses exists. In the preferred implementation described herein, a neural network is trained to recognize patterns in the levels of certainty indicative of whether a diagnosis can be made or there is so much conflict that the diagnosis process should be halted. Further, the preferred neural network is configured to be generic, that is, it can be used without modification or retraining for different diagnosis (classification) problems and different diagnosis models.

While the Sheppard reference discloses a neural network is trained to recognize patterns, the cited portion does not disclose that the neural network recognizes patterns in test data as defined in the present application. On the contrary, the Sheppard reference neural network recognizes patterns in levels of certainty, not test data. Thus, the cited portion of the Sheppard reference fails to disclose an express limitation in the relevant claims, so the rejections of the claims are improper and should be withdrawn.

Claims 5, 18, 31, and 43 call for comparing the recognized pattern to a known pattern associated with the characteristic. These claims stand rejected as being anticipated by the Sheppard reference at column 3, lines 65-68, which reads:

The diagnostic tester further comprises testing sufficiency determining means, responsive to the first and second certainty signals, for producing an output signal indicative of whether sufficient test data has been evaluated to declare a diagnosis. Preferably, the evaluating means also produces an uncertainty signal corresponding to a measure of the uncertainty that the evaluated at least one test signal can be validly evaluated; and the testing sufficiency determining means also evaluates the uncertainty signal to produce the output signal.

Nothing in the cited portion of the Sheppard reference discloses a recognized pattern, a known pattern, or an identified characteristic, and nothing in the cited portion relates to comparing a recognized pattern to a known pattern associated with a characteristic. Thus, the applicant respectfully submits that these rejections should be withdrawn. If these rejections are to be maintained, the applicant respectfully requests an adequate explanation of the rejections based on the cited portion of the Sheppard reference such that the applicant may properly analyze the validity of the rejections. The applicant further submits that if these rejections are to be maintained, the rejections should not be made final until the rejections are adequately supported to allow the applicant an opportunity to assess the merits of the rejections.

Claims 6, 19, 32, and 44 require automatically learning an additional pattern based on the recognized pattern. These claims stand rejected as being anticipated by the Sheppard reference at column 8, line 38, which reads:

> The rule-based expert system is perhaps the most common of the "intelligent" diagnostic systems.

Nothing in the cited portion of the Sheppard reference discloses learning an additional pattern based on the recognized pattern. Further, the cited portion of the Sheppard reference does not disclose a pattern recognition system comprising an intelligent system configured to automatically learn an additional pattern based on the recognized pattern. The mere mention of "intelligent diagnostic systems" does not provide an anticipating disclosure of these limitations and elements in the claims. Thus, the applicant respectfully submits that the rejections of these claims are not supported and should be withdrawn. The applicant further submits that if these rejections are to be maintained, the rejections should not be made final until the rejections are adequately supported to allow the applicant an opportunity to assess the merits of the rejections.

Claims 7, 20, 33, and 45 stand rejected as being anticipated by the Sheppard reference at column 12, lines 14-19. The relevant claims call for classifying the recognized pattern according to a known pattern. The cited portion of the Sheppard reference reads:

First, time and cost penalties can be applied that affect time and cost weights until a test group is entered (a test within the group is selected). Second, specific sequencing of tests within groups can be defined which overrides normal test selection choices. Third, sequencing of entire test groups can be defined which also override normal test selection choices.

Nothing in the cited portion of the Sheppard reference discloses, corresponds to, or resembles a recognized pattern, a known pattern, a classifier, or classifying a recognized pattern according to a known pattern. Thus, the applicant respectfully submits that these rejections should be withdrawn, as the cited portion discloses nothing that appears to be relevant to the claims. The applicant further submits that if these rejections are to be maintained, the rejections should not be made final until the rejections are adequately supported to allow the applicant an opportunity to assess the merits of the rejections.

Claims 8, 21, 34, and 46 stand rejected as being anticipated by the Sheppard reference at column 19, line 7. The claims require the classifier to comprise or the classification of the recognized pattern to be performed by a neural network. The cited portion of the Sheppard reference reads:

In the preferred implementation described herein, a neural network is trained to recognize patterns in the levels of certainty indicative of whether a diagnosis can be made or there is so much conflict that the diagnosis process should be halted. Further, the preferred neural network is configured to be generic, that is, it can be used without modification or retraining for different diagnosis (classification) problems and different diagnosis models.

As discussed previously, the cited portion indicates that the neural network operates on levels of certainty indicative of whether a diagnosis can be made, not recognized patterns in the test data as required by the claims. Moreover, although the cited portion mentions "classification",

nothing in the cited portion of the Sheppard reference discloses that any classification is performed for classifying a recognized pattern according to a known pattern. Mere mention of "classification" does not adequately support the rejections of these claims, and the rejections should be withdrawn.

In sum, the Sheppard reference does not support any of the rejections. Accordingly, the applicant respectfully submits that all of the claims are allowable over the Sheppard reference. If any of these rejections are to be maintained based on the Sheppard reference, the applicant respectfully requests clarification of the rejections such that the rejections may be properly analyzed. Further, the applicant respectfully submits that several rejections seem to have no support whatsoever and thus do not give the applicant sufficient opportunity to respond. Accordingly, if any such rejections are to be maintained, the applicant respectfully submits that the rejections should not be made final until the rejections are adequately supported.

Gorin:

Claims 1, 14, 27, and 39 stand rejected under 35 USC 102(a) as being anticipated by U.S. Patent No. 6,442,499 to Gorin. With regard to claims 1, 27, and 39, the office action asserts that the Gorin reference discloses a diagnostic system configured to receive the test data from the tester and automatically analyze the test data to identify a characteristic of the fabrication process for the components at column 6, line 54. The cited portion of the Gorin reference reads:

> The selected optimized wait period may then be applied to testing of the remaining components, for example the components of the wafer, lot, test run or the like. The wait period may be reoptimized according to the present embodiment in conjunction with any suitable criteria, such as the likelihood of variations in the environment, component characteristics, introduction of a new lot of wafers or batch of components, test equipment, engineering requirements or production requirements, or any other circumstances that may affect the accuracy of the optimized wait period.

Nothing in the cited portion of the Gorin reference discloses a diagnostic system at all, and certainly not a diagnostic system configured to analyze the test data to identify a characteristic of the fabrication process for the components. On the contrary, the cited portion of the Gorin reference refers to optimizing wait period for testing components. Consequently, the rejections should be withdrawn.

With regard to claim 14, the office action asserts that the Gorin reference discloses a diagnostic system having access to the memory and configured to identify a characteristic of the fabrication process based on the test data at column 4, line 11. The cited portion of the Gorin reference reads:

> The acceptable component 106 is tested one or more times (steps 402, 404), for example ten times in the present embodiment, using the initial wait period P, and the output test signals are collected and stored for each test. The data corresponding to the initial wait period P may then be used to determine a set of baseline data which may then be used to optimize the wait period.

The cited portion of the Gorin reference relates to testing components using an initial wait period to establish baseline data for wait period optimization for testing. The cited portion does not disclose a diagnostic system at all, nor does it disclose identifying any characteristic of a fabrication process based on test data. Because the cited portion does not disclose the limitations of claim 14, the rejection is improper and should be withdrawn.

Obviousness Rejections under § 103

Claims 9-10, 12-13, 22-23, 25-26, 35-36, 38, 47-48, and 50 stand rejected as being obvious based on the Sheppard reference in view of U.S. Patent Publication No. 2002/0054694 to Vachtsevanos ("the Vachtsevanos reference"). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the

references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure.

The applicant respectfully submits that the obviousness rejections are improper because the cited references fail to teach or suggest all claim limitations and the office action provides no suggestion or motivation to modify the references or to combine reference teachings to arrive at the claimed invention. Consequently, the rejections should be withdrawn.

More particularly, as described above, the Sheppard reference fails to disclose the subject matter of all of the pending claims. Thus, the obviousness rejections are unsupported, as the Sheppard reference does not disclose the various elements and limitations in the claims. On these grounds alone, the obviousness rejections should be withdrawn.

Furthermore, the Vachtsevanos reference fails to disclose various other elements of the claimed invention as asserted in the office action. In particular, claims 9, 22, 35, and 47 stand rejected as being obvious in view of the Sheppard reference and the Vachtsevanos reference at paragraph 0027. The relevant claims require that the neural network comprise a radial basis function network. The cited portion of the Vachtsevanos reference reads as follows:

> The approximation error is minimized by adjusting the activation function and network parameters using empirical (experimental) data. Two types of activation functions are commonly used: global and local. Global activation functions are active over a large range of input values and provide a global approximation to the empirical data. Local activation functions are active only in the immediate vicinity of the given input value. Typical global activation functions, the linear threshold and the sigmoid function, are shown in FIGS. 2a and 2b. The Gaussian for radial basis function networks is a typical example of a local activation function is shown in FIG. 2c. The functions which can be

computed by a Back Propagation Network (BPN) with one hidden layer having m nodes
constitute the set S.sub.m defined by: [equation].

Although the cited portion of the Vachtsevanos reference mentions radial basis function
networks, it does not disclose a classifier comprising a neural network, wherein the neural
network comprises a radial basis function network. Further, the cited portion of the
Vachtsevanos reference provides no teaching or motivation to combine the disclosure of the
Sheppard reference with cited portion of the Vachtsevanos reference to arrive at the claimed
invention. The office action states that it would be obvious to so modify the Sheppard system
"for the purpose of classification accuracy tasks and function approximation", but nothing in
cited portion of the Vachtsevanos reference supports this position. Instead, the cited portion of
the Vachtsevanos reference relates to minimizing approximation error, and refers to the Gaussian
of radial basis function networks as an example of a local activation function. In view of the
failure of the Sheppard and Vachtsevanos references to disclose the claimed elements and
limitations, as well as the failure to include any teaching or suggestion to modify the references
to arrive at the claimed invention, the applicant respectfully submits that the rejections should be
withdrawn. To the extent the office action relies on "common knowledge" in the rejections of
the claims, the applicant traverses these findings and requests adequate evidence to support them
in accordance with MPEP 2144.03.

Claims 10, 23, 36, and 48 stand rejected as being obvious in view of the Sheppard
reference and paragraph 0180 of the Vachtsevanos reference. The relevant claims call for the
pattern recognition system to include a feature extractor configured to extract a feature from the
test data associated with the pattern. The cited portion of the Vachtsevanos reference reads:

Referring to FIG. 16, the off-line portion 200 is the training portion of the system that
provides the information for determining which features of the signal are measured by the
feature extractor 60 and the weights of the wavelets in the WNN 65. The problem of
feature extraction is determining what aspects of the input signal should be isolated for

application to the classifier, i.e. what features to select. The vision systems employed in industrial pattern detection process, e.g. fabric inspection, typically generate massive amounts of multidimensional data that is corrupted by noise and exists in a cluttered environment. It is important to be able to data-mine, fuse, filter and or otherwise extract useful information from the raw data. This can be accomplished by decreasing the complexity of the input space or increasing the computational capability of the processor, or both. To reduce the cost and complexity of a pattern detection system it is preferred to view the problem of feature extraction as it relates to the fundamental intelligent task of inductive classification. It should be noted that criteria for feature selection are dependent on the application for which the pattern recognition system is being utilized. This is because the characteristics of the materials and faults will determine which set or class of features has the greatest differentiation between the fault and normal states.

Although the cited portion of the Vachtsevanos reference mentions feature extraction, it does not disclose extracting features from test data associated with the pattern. Mere mention of feature extraction in the Vachtsevanos reference does not disclose the claimed elements and limitations. In view of the failure of the Sheppard and Vachtsevanos references to disclose the claimed elements and limitations, the applicant respectfully submits that the rejection should be withdrawn. To the extent the office action relies on "common knowledge" in the rejections of the claims, the applicant traverses these findings and requests adequate evidence to support them in accordance with MPEP 2144.03.

Claims 12, 13, 25, 26, 38, and 50 stand variously rejected as being obvious in view of the Sheppard reference and paragraphs 0159, 0189, 0184, and 0181 of the Vachtsevanos reference. As mentioned above, however, the Sheppard reference fails to disclose the elements and limitations of the claims from which these claims depend. To the extent the office action relies on "common knowledge" in the rejections of the claims, the applicant traverses these findings and requests adequate evidence to support them in accordance with MPEP 2144.03.

Allowable Subject Matter

The office action indicates that claims 11, 24, 37, and 49 would be allowable if rewritten in independent form. The applicant acknowledges the allowability of the subject matter of these claims and thanks the examiner for the examination and notification.

## CONCLUSION

Please consider the amendments and remarks. In view of the present amendments and comments, the applicant respectfully submits that the claims are in condition for allowance. Please contact the undersigned attorney at the address and telephone number noted below with any questions or comments.

Respectfully submitted,

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